

KEY AND COMMENTARY ON THE
SPECIES OF SPATHIPHYLLUM (ARACEAE) IN
COSTA RICA, INCLUDING S. SILVICOLA, SP. NOV.

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As in all other Costa Rican aroid genera, Spathiphyllum is poorly collected. Bunting's 1960 monograph of the genus recognized five species on mainland Costa Rica, based on only 21 collections available to him at that time. Since then, the number of collections has more than doubled and the number of species has increased to seven. Nevertheless, more specimens are needed to determine the morphological variation of the species in our region. Recent collections suggest that additional specimens may yield further taxa. The following is a brief account of the Costa Rican species of Spathiphyllum as we now understand them.

Commentary on species

SPATHIPHYLLUM ATROVIRENS Schott

This is a rare species known from only three existing collections. The type, Wendland 1264, is believed to have been destroyed at Vienna or Berlin (Bunting, 1960). Bunting designated Pittier 9053 (at US, duplicate at BR) as the neotype and also cited Pittier 7995 (BR). Both were collected near San Francisco de Guadalupe, about 1150 m altitude, Province of San Jose. This species has most recently been collected near Monteverde in Guanacaste Province (Kennedy 561).

SPATHIPHYLLUM FRIEDRICHSTHALII Schott

Numerous recent collections support the restriction of this common species to the Atlantic lowlands.

SPATHIPHYLLUM FULVOVIRENS Schott

Bunting expressed doubt as to the exact locality of Wendland 939, the type of S. fulvovirens (probably destroyed at Vienna), from Pedregal, Costa Rica. Bunting narrowed it down to the provinces of Heredia and Cartago on the Atlantic slopes of the Cordillera based on Standley's statement that Wendland entered Costa Rica "by the Sarapaqui Valley, and explored especially the mountain chain from Barba to Turrialba" (Standley, 1937). A map issued in 1966 and two recent collections of S. fulvovirens may help to pinpoint this particular locale. The 1:500,000 map of Costa Rica (Edicion Provisional, 1966) shows Pedregal to be one kilometer due west of Puerto Viejo on Highway 9 in Heredia Province (Pedregal is not shown on any other map seen). This agrees

very well with Standley's statement placing Wendland in the Sarapaqui Valley and with our two recent collections: "near the Rio Puerto Viejo, about 2 km upstream from the confluence with the Rio Sarapaqui, 10°26'N x 84°0'W" (Burger & Stolze 5761); and "about 8 km southwest of Puerto Viejo, 10°26'N x 84°02'W" (Burger & Matta 4294).

SPATHIPHYLLUM LAEVE Engler

The most surprising range extension we have encountered is that of *S. laeve*, previously believed to be endemic to Cocos Island. Comparison of seven mainland collections with the type (Pittier 12370) and two other Cocos Island collections (Gomez 3286; Holdridge 5165) showed no discernible differences. This species is now known from between 100 and 1000 m elevation along the Atlantic slopes of the Cordillera de Guanacaste and the Cordillera Central. The Costa Rican collections range from near Tirimbina in the South to near Canalete in the North. The new collections are: Burger & Burger 8075; Burger & Baker 9953; Jimenez M. 3430; and Lent 2124, 2885. To this species we also refer Brenes 4923, which apparently was not available to Bunting at the time of his study, and tentatively, a Panamanian specimen, J.A. Duke 14973, from Cocle Province, Cerro Pilon, El Valle, 3000 feet altitude. The Panamanian specimen most certainly belongs to *Spathiphyllum* sect. *Massowia* and probably to *S. laeve*, but more material is needed to verify this.

SPATHIPHYLLUM PHRYNIIFOLIUM Schott

Available collections suggest this species to be relatively widespread in Costa Rica, but apparently uncommon. *Spathiphyllum phryniifolium* was previously known only from near Tilaran in Guanacaste Province (Standley & Valerio 46032). It has been collected in Puntarenas Province near Palmar Norte de Osa (Allen 5800) and in Cartago Province near Turrialba (Jimenez M. 3294).

SPATHIPHYLLUM SILVICOLA R. Baker, sp. nov.

Foliorum lamina obliqua, e ovata-elliptico ad elliptica-oblongo, (20) 23-30 cm longa et (7) 9-10.5 (11.5) cm lata, ad apicem acuminata, ad basim obtusata, venis primariis multis angulo 60-70° divergentibus; petiolus 25-59 cm longus, ad 1/3-1/2 (2/3) vaginatus; geniculum 1.4-2.0 cm longum. Pedunculus (42) 57-79 cm longus; spatha (8) 12-15 cm longa et 2.5-3.0 cm lata, e lanceolata ad anguste elliptica, apice longo acuminato, basi acuta vel obtusata et in pedunculo 0.5-1.0 cm decurrenti, pallida virida; spadix 3.5-6 (7.2) cm longus, albus per anthesin, stipite 0.6-1.2 cm longo; perianthiorum segmenta connata in dimidio inferiore; pistillum perianthium aequans, obpyramidale, apice truncato, stigmatе trilobato perianthium leviter superanti (plerumque in Exsiccatis depresso); ovarium 3-loculare, loculis 2-3-ovulatis, 6-7 in toto ovario. HOLOTYPE: Allen 5538 in F (1741645), ISOTYPI: CR, US, EAP.

Leaf blade oblique, one half differing from the other by 0.5-1.5 cm at the broadest point, ovate-elliptic to elliptic-oblong, 20-36 cm long and 7.0-11.5 cm wide (2.5-3.5 times as long as wide), usually widest at or below the middle, the apex acuminate, the base obtuse, the primary lateral veins many, forming an angle of 60-70° with the midvein at blade midpoint; petiole 25-59 cm long, vaginate 1/3-1/2 (2/3) the length of the petiole; geniculum 1.0-2.0 cm long. Peduncle 35-79 cm long, as long as the petiole to twice as long; spathe 7-15 cm long, 1.5-3.4 cm wide (ca. 4-5 times as long as wide), lanceolate to narrowly elliptic, the apex long-acuminate, basally acute to obtuse and decurrent on the peduncle 0.5-1.2 cm, pale green; stipe 0.5-1.0 (1.4) cm long; spadix (3.5) 4.8-6.0 cm long (to 7.2 cm long on fruiting specimens), white at anthesis; perianth segments 1.5-2.0 mm long, basally connate for about 1/2 their length or more; stamens as many as the perianth parts, the filaments 0.5-0.6 mm long, flat and broad, the anthers 0.8-1.0 mm long; pistil equal in length to the perianth, obpyramidal, apically truncate, the 3-lobed stigma slightly exceeding the perianth (however, often depressed in dried specimens); ovary 3-locular with 2-3 ovules per locule totaling 6-7 ovules per ovary; immature fruits green (fide Burger), the immature seeds having a smooth surface between uneven rows of white projections (seeds collapsed), mature fruits becoming pale orange (fide Raven), mature seeds with a brown, relatively smooth seed coat, very slightly furrowed or pitted.

Plants of forest shade of the tropical wet forest formations of the Osa Peninsula and the adjacent Golfo Dulce region, to 100 meters altitude, in Puntarenas Province, Costa Rica; collected in flower and fruit from late May to November.

Spathiphyllum silvicola belongs to Spathiphyllum sect. Amomophyllum and appears to be most closely related to the Peruvian species S. lechlerianum Schott based on the similarity of spathe attachment. Spathiphyllum silvicola differs from that species in its larger size, its broader and longer leaves, its larger angle of primary lateral vein divergence, its longer spadix, and the smaller number of ovules. Most specimens assigned to this new species had previously been identified as S. fulvovirens, its closest relative in Costa Rica. Spathiphyllum silvicola differs from S. fulvovirens by the attachment of the spathe, the shape of the spathe (see illustration), the usually shorter, more narrow leaves, and the smaller spadix. Superficially, S. silvicola most resembles S. laeve in size, shape of spathe, and attachment of the spathe. However, S. laeve can be distinguished by the apically entire, cuplike perianth characteristic of Spathiphyllum sect. Massowia to which it belongs (see illustration) and by the slightly larger, greyish seeds with strongly tuberculate surfaces.

ADDITIONAL COLLECTIONS: Utley & Utley 1202, 1181; Raven 21712; Skutch 5257; Burger & Stolze 5561; and Jimenez M. 2246.

SPATHIPHYLLUM WENDLANDII Schott

In his monograph, Bunting noted two forms of this species, the typical low altitude form with an alate geniculum and a high altitude form with a non-alate geniculum, smaller, elliptic leaves, and a shorter stipe. New collections, all from 1500 m altitude or more, confirm these differences and it is now evident that this taxon deserves formal recognition.

SPATHIPHYLLUM WENDLANDII Schott subsp. MONTANUM R. Baker, subsp. nov.

Differt a subsp. wendlandii foliis minoribus ellipticis, geniculis non-alatis, et stipibus minoribus.

HOLOTYPE: Burger & Baker 9688 in F, ISOTYPUS: US.

Plants of forest shade of the premontane wet and rain forests and the lower montane rain forests ranging from Monteverde in Guanacaste Province to San Vito in Puntarenas Province. Found on both the Pacific and Atlantic slopes from 1100-1700 m altitude. Also known from adjacent Chiriqui Province in Panama. The altitudinal range of subsp. montanum is very unusual for the genus Spathiphyllum. Of the Costa Rican species, only S. atrovirens is known to reach the lower limits of this range.

ADDITIONAL COLLECTIONS: Lent 1561, 2305; Raven 21848; A. Smith 337, 857, 927; Brenes 22126; Burger & Baker 9343; Burger & Liesner 6850; and Davidson 565 (Panama).

SPATHIPHYLLUM WENDLANDII Schott subsp. WENDLANDII

The lowland subspecies has not been collected above 500 m altitude. New collections of subsp. wendlandii are: Lent 67; Jimenez M. 2099; Burger & Stolze 5011 (all from the Atlantic lowlands); Burger & Matta 4817; Burger & Stolze 5598; Utley & Utley 1181, 1057 (all from the Osa Peninsula and the nearby Golfo Dulce region). Spathiphyllum wendlandii had not previously been reported from the Pacific lowlands.

Lastly, it should be noted that another recent collection (Burger & Matta 4445) may possibly represent an undescribed species. It was collected near the property of Mr. Robert Wilson near San Vito at an altitude of 1100 m. The leaf is oblanceolate and basally attenuate and decurrent, forming a wing on the geniculum as in S. wendlandii subsp. wendlandii; however, floral characters seem to indicate a closer relationship with S. phryniifolium.

Key to the species of Spathiphyllum in Costa Rica

- 1a. Perianth segments totally connate, cuplike, the apex entire.....S. laeve
- 1b. Perianth segments separate, or connate basally for a portion of their length.....2a
- 2a. Spathe non-decurrent or decurrent on the peduncle for less than 1.5 cm; pistil equaling the perianth, only the nipple-like stigma slightly exceeding the perianth....3a
- 2b. Spathe decurrent on the peduncle for 2-10 cm; pistil exceeding the perianth, the style attenuate or conic (except S. atrovirens and then the spathe decurrent more than 5 cm).....4a
- 3a. Spathe non-decurrent, the apex short-acuminate; spadix 6.8-11.5 cm long; perianth of totally separate segmentsS. fulvovirens
- 3b. Spathe decurrent 0.5-1.2 cm, the apex long-acuminate; spadix 4-6 (7.2) cm long; perianth segments connate basally for 1/2 their length or more.....S. silvicola
- 4a. Ovules mostly 8-6 per locule (24-12 per ovary); exerted portion of the style ca. 3 times as long as the perianth; spadix stout, sessile or on a short, stout stipe, densely flowered; spathe typically broadly oblanceolate (to elliptic).....S. friedrichsthali
- 4b. Ovules 4-1 per locule (8-2 per ovary); exerted portion of the style not more than twice as long as the perianth; spadix relatively slender, usually on a slender stipe, flowers not densely crowded; spathe various.....5a
- 5a. Base of leaf blade attenuate and decurrent forming a wing on the geniculum, blade typically oblanceolate; apex of perianth parts membranous, the margin fimbriate or erose and often deeply notched; 0-500 meters altitude.....S. wendlandii subsp. wendlandii
- 5b. Base of leaf blade acute to obtuse, not forming a wing on the geniculum, blade various but rarely oblanceolate; apex of perianth parts scarcely membranous, not fimbriate or erose (except S. wendlandii subsp. montanum); 0-1700 meters altitude.....6a
- 6a. Pistil subtruncate, constricted between the annular style and the ovary.....S. atrovirens
- 6b. Pistil not subtruncate, the style attenuate or conic.....7a

- 7a. Apical, inflexed portion of the perianth segments conspicuous, 1-2 mm long, the distal 1/2 membranous and conspicuously convex, the margin fringed, notched, or entire; leaves typically elliptic (rarely oblanceolate); stipe about 0.5 cm long, stout; 1100-1700 meters altitude.....S. wendlandii subsp. montanum
- 7b. Apical, inflexed portion of the perianth segments inconspicuous, less than 0.7 cm long, the distal portion scarcely membranous, truncate to concave, the margins not fringed or notched; leaves typically lanceolate (rarely elliptic); stipe 0.5-1.2 cm long, slender; below 1000 meters altitude.....S. phryniifolium

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